

Beamline 16-BM / HP-CAT

Scientific focus: Study of materials at high pressures in the fields of physics, chemistry, materials science, and planetary science

Scientific programs: Studies of materials under high pressure and variable temperature using diamond-anvil cells and other high-pressure devices using diffraction (energy and angle dispersive, single crystals, and powders) and absorption spectroscopy

NOTE: The detailed design of stations 16-BM-C and -D is not completely finalized, and small changes may still be made during the second half of 2001.

Optics & Optical Performance

16-BM-A

- beam splitter (1 mrad inboard, 0.5 mrad outboard)
- double-crystal water-cooled Si monochromator (optional)

16-BM-B

- small Kirkpatrick-Baez microfocusing mirrors for white beam

16-BM-C

- vertically focusing mirror
- horizontal focusing (*under study*)

Experiment Station

16-BM-B

- microfocused white beam diffraction
- instrument and technique development

16-BM-D

- absorption spectroscopy
- monochromatic diffraction

Detectors

- single-point energy-dispersive detectors
- multi-element energy-dispersive detectors
- two-dimensional imaging detector

Beamline Controls and Data Acquisition

- Windows NT/UNIX-Linux workstations running VME
- EPICS/SPEC control software
- IDL and customized data acquisition/beamline control software

Beamline Support Equipment/Facilities

- custom-designed diffractometers and other sample handling stages
- diamond-anvil cells
- portable large-volume cell (*"Paris-Edinburgh" design likely*)
- *in situ* pressure measurement instrumentation
- cryostats
- optical spectrometers

Bending Magnet Source Characteristics (nominal)

source	APS bending magnet
critical energy	19.51 keV
on-axis peak brilliance at 16.3 keV	2.9×10^{15} ph/sec/mrad ² /mm ² /0.1%bw
on-axis peak angular flux at 16.3 keV	9.6×10^{13} ph/sec/mrad ² /0.1%bw
on-axis peak horizontal angular flux at 5.6 keV	1.6×10^{13} ph/sec/mradh/0.1%bw
source size at critical energy \sum_x \sum_y	145 μ m 36 μ m
source divergence at critical energy $\sum_{x'}$ $\sum_{y'}$	6 mrad 47 μ rad